

Unit IV

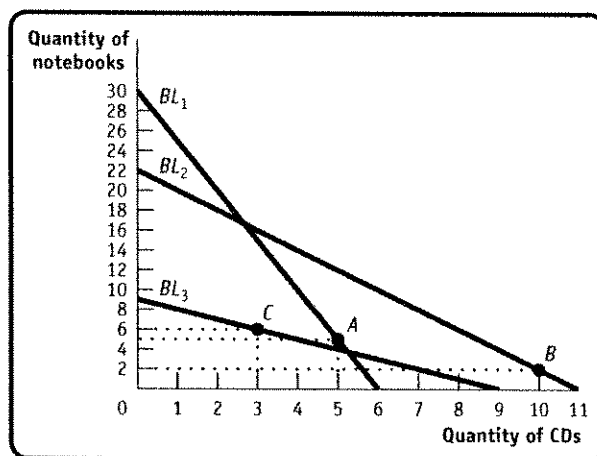
The Rational Consumer (KW Chapter 10)

2.

After you have taken the first newspaper, the marginal utility of the second newspaper is zero: you don't learn any more news by having two copies of the same paper instead of just one. So once you have paid for the vending machine to open, you will only take one paper. For soda, on the other hand, marginal utility is positive: after you have drunk the first soda, the second will still give you more utility. It will give you less utility than the first soda—that is, there is diminishing marginal utility -- but the marginal utility of the second soda is still positive. If the vending machine allowed you to take more than one soda at a time after paying for only one, you would. So the soda vending machine has to be designed to prevent you from taking more than one soda, and it does so by dispensing only one soda at a time.

5.

The three bundles are illustrated in the accompanying diagram.



- a. The budget line is labeled BL_1 . Bundle A is on the budget line. Bundle C is also a possible consumption bundle, but it would involve not spending all income (which would not be rational). Bundle B is outside Bruno's budget line, so it is not a possible consumption bundle.
- b. The budget line is labeled BL_2 . Bundle B is on the budget line; that is, it is a bundle that Bruno can just afford to buy and spend all his income. A and C are bundles he could also afford to buy, but they are below his budget line, so he would not be spending all his income (which would not be rational).

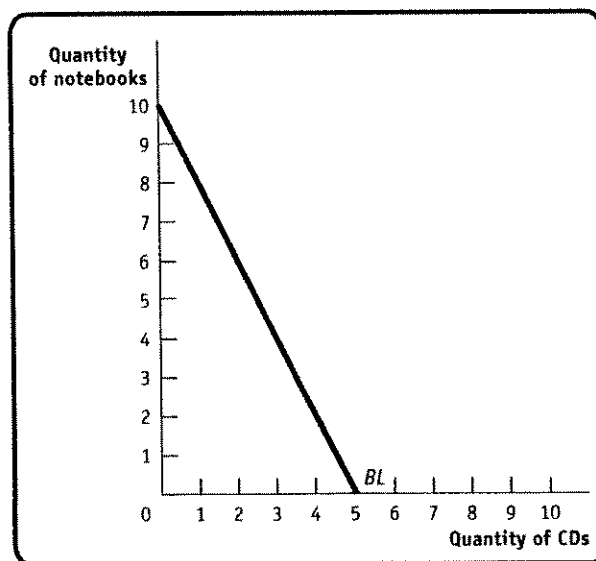
- c. The budget line is labeled BL_3 . The reason why this is the correct budget line is as follows: It has to go through bundle C, and the slope of the budget line has to be -1 : as you get 1 more CD, you have to give up 1 notebook. Or, conversely, if you give up 1 CD, you can get 1 more notebook. This implies that bundles A and B are not possible consumption bundles for Bruno: they both lie beyond the budget line.

6.

- a. Bernie can consume the following bundles if he spends all his income:

| | |
|---------------|-------|
| 0 notebooks, | 5 CDs |
| 2 notebooks, | 4 CDs |
| 4 notebooks, | 3 CDs |
| 6 notebooks, | 2 CDs |
| 8 notebooks, | 1 CD |
| 10 notebooks, | 0 CDs |

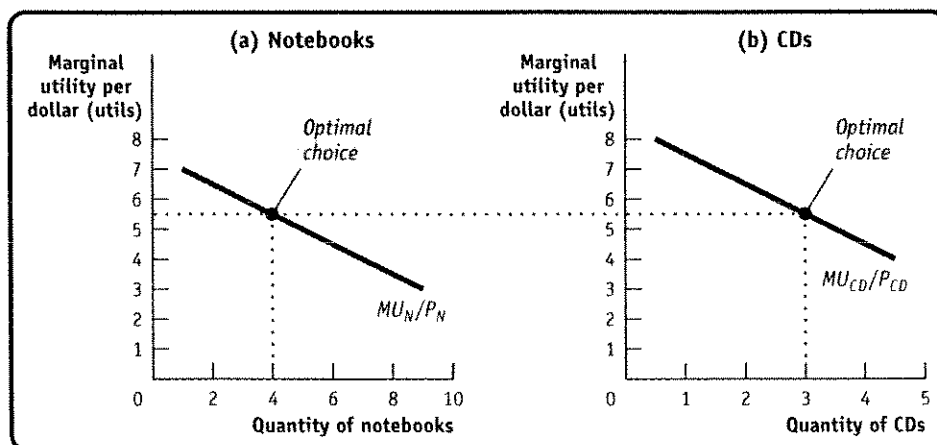
The accompanying diagram shows Bernie's budget line.



- b. The accompanying table shows the marginal utility for each notebook and for each CD, the marginal utility per dollar spent on notebooks, and the marginal utility per dollar spent on CDs. Note that the utility numbers for notebooks are given in increments of 2: for instance, going from 4 notebooks to 6, utility increases by 50 utils (from 130 utils to 180 utils). Per notebook, this is a marginal utility of 25 utils.

| Quantity of notebooks | Utility from notebooks (utils) | Marginal utility per notebook (utils) | Marginal utility per dollar (utils) | Quantity of CDs | Utility from CDs (utils) | Marginal utility per CD (utils) | Marginal utility per dollar (utils) |
|-----------------------|--------------------------------|---------------------------------------|-------------------------------------|-----------------|--------------------------|---------------------------------|-------------------------------------|
| 0 | 0 | | | 0 | 0 | | |
| 2 | 70 | 35 | 7 | 1 | 80 | 80 | 8 |
| 4 | 130 | 30 | 6 | 2 | 150 | 70 | 7 |
| 6 | 180 | 25 | 5 | 3 | 210 | 60 | 6 |
| 8 | 220 | 20 | 4 | 4 | 260 | 50 | 5 |
| 10 | 250 | 15 | 3 | 5 | 300 | 40 | 4 |

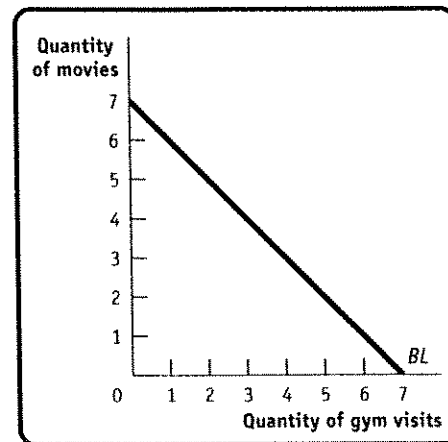
- c. The optimal consumption rule states that the optimal bundle, from all those on a consumer's budget line, is the one at which the marginal utility per dollar spent on each good is equal. The accompanying diagram shows the marginal utility per dollar spent on notebooks in panel (a) and the marginal utility per dollar spent on CDs in panel (b). When Bernie consumes 4 notebooks and 3 CDs, the marginal utility per dollar spent on notebooks is the same as the marginal utility per dollar spent on CDs, so this is the optimal bundle. It is also the only bundle -- from all the bundles he can consume (that is, from all the bundles on his budget line) -- for which the marginal utility per dollar is equal for the two goods.



9.

- a. Damien can consume the following bundles if he spends all his time going to the gym and watching movies:

| | |
|---------------|----------|
| 0 gym visits, | 7 movies |
| 1 gym visit, | 6 movies |
| 2 gym visits, | 5 movies |
| 3 gym visits, | 4 movies |
| 4 gym visits, | 3 movies |
| 5 gym visits, | 2 movies |
| 6 gym visits, | 1 movie |
| 7 gym visits, | 0 movies |

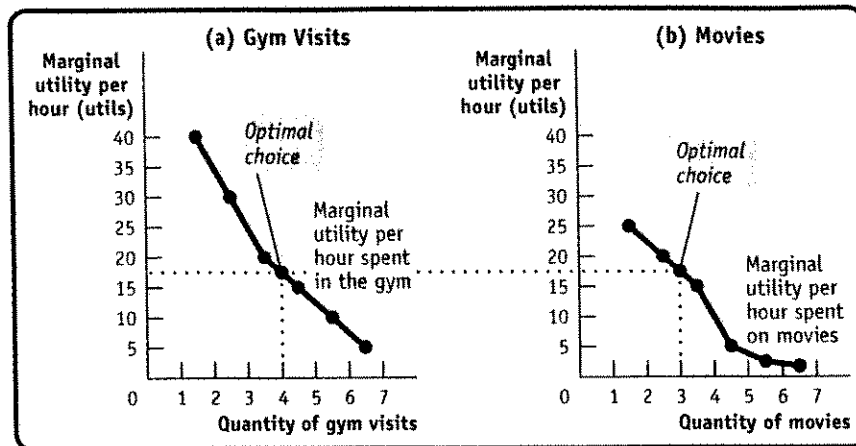


The accompanying diagram illustrates Damien's budget line.

- b. The accompanying table shows Damien's marginal utility per gym visit, marginal utility per movie, marginal utility per hour spent on gym visits, and marginal utility per hour spent on movies.

| Quantity of gym visits per week | Utility from gym visits (utils) | Marginal utility per gym visit (utils) | Marginal utility per hour (utils) | Quantity of movies per week | Utility from movies (utils) | Marginal utility per movie (utils) | Marginal utility per hour (utils) |
|---------------------------------|---------------------------------|--|-----------------------------------|-----------------------------|-----------------------------|------------------------------------|-----------------------------------|
| 1 | 100 | 80 | 40 | 1 | 60 | 50 | 25 |
| 2 | 180 | 60 | 30 | 2 | 110 | 40 | 20 |
| 3 | 240 | 40 | 20 | 3 | 150 | 30 | 15 |
| 4 | 280 | 30 | 15 | 4 | 180 | 10 | 5 |
| 5 | 310 | 20 | 10 | 5 | 190 | 5 | 2.5 |
| 6 | 330 | 10 | 5 | 6 | 195 | 2 | 1 |
| 7 | 340 | | | 7 | 197 | | |

- c. The accompanying diagram shows Damien's marginal utility per hour spent on gym visits in panel (a) and his marginal utility per hour spent watching movies in panel (b). Of all the bundles on his budget line, the bundle containing 4 gym visits and 3 movies is optimal: this is the bundle at which the marginal utility per hour spent in the gym is equal to the marginal utility per hour spent watching movies.



10.

Damien is right. Since Anna's marginal utility for the last movie is twice as large as the marginal utility for a gym visit, but gym visits and movies "cost" the same in terms of hours spent, Anna's marginal utility per hour spent on movies is twice as large as her marginal utility per hour spent on gym visits. So she should spend more of her time going to movies and less going to the gym.

15.

Since Margo buys her optimal consumption bundle, the marginal utility per dollar spent on visits to the hair salon must be equal to the marginal utility per dollar spent on pairs of high-heeled shoes. Here, the marginal utility per dollar spent on visits to the hair salon is $100 \text{ utils per visit} / \$50 \text{ per visit} = 2 \text{ utils per dollar}$. The marginal utility per dollar spent on pairs of high-heeled shoes therefore has to equal 2 utils per dollar. Since the marginal utility of a pair of high-heeled shoes is 300 utils per pair, the price of a pair of shoes has to be $\$150 \text{ per pair}$, so that $300 \text{ utils per pair} / \$150 \text{ per pair} = 2 \text{ utils per dollar}$.